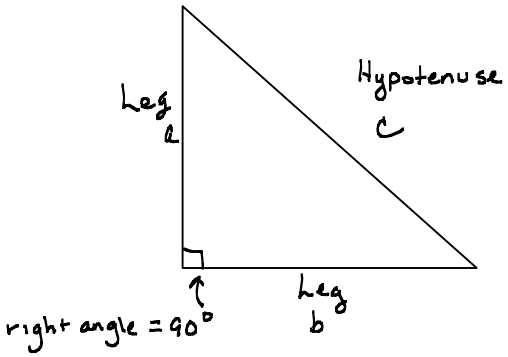
Section A-2
Geometry Review

Objectives
1. Use the Pythagorean Theorem and Its Converse

Properties of Right Triangles:

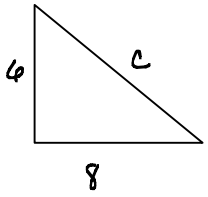


The hypotenuse is opposite the right angle and is the longest side.

Pythagorean Theorem—In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs. That is, in the right triangle shown above,

$$a^2 + b^2 = c^2$$

Example: For the following triangle, find the hypotenuse.



$a = 6$

$b = 8$

$a^2 + b^2 = c^2$

$6^2 + 8^2 = c^2$

$36 + 64 = c^2$

$100 = c^2$

$10 = c$

Converse of the Pythagorean Theorem-In a triangle, if the square of the length of one side equals the sum of the squares of the lengths of the other two sides, then the triangle is a right triangle. The 90 degree angle is opposite the longest side.

Example: The lengths of the sides of a triangle are 8, 15, and 17. Determine if this is a right triangle.

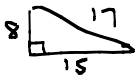
Square the lengths of the sides.

$8^2 = 64$

$15^2 = 225$

$17^2 = 289$

Since the sum of the first two squares (64 and 225) equals the third square, this is a right triangle



Example: The lengths of the sides of a triangle are 3, 6, 7. Determine if this is a right triangle.

Square the lengths of the sides.

$3^2 = 9$

$6^2 = 36$

$7^2 = 49$

Since the sum of the first two squares (9 and 36) does not equal the third square (49), this is not a right triangle.